**Final**

# Preliminary Assessment for Per- and Polyfluoroalkyl Substances (PFAS) Seaplane Base

## Naval Air Station Whidbey Island
## Oak Harbor, Washington

**Contract Task Order 4041**

**September 2018**

Prepared for

**Department of the Navy**
**Naval Facilities Engineering Command**
**Northwest**

Under the

**NAVFAC CLEAN 9000 Program**
**Contract N62470-16-D-9000**

Prepared by

ch2m SM

**Seattle, Washington**

# Contents

## Appendixes



## Table



## Figures

# Acronyms and Abbreviations

| | |
|---|---|
| µg/L | micrograms per liter |
| AEMT | Advanced Emergency Medical Technician |
| AFFF | aqueous film forming foam |
| CH2M | CH2M HILL, Inc. |
| CLEAN | Comprehensive Long-term Environmental Action—Navy |
| DoD | Department of Defense |
| ER | Environmental Restoration |
| FTA | fire training areas |
| GIS | geographic information system |
| msl | mean sea level |
| LHA | lifetime health advisory |
| NAS | Naval Air Station |
| NAVFAC | Naval Facilities Engineering Command |
| Navy | Department of the Navy |
| OLF | Outlying Landing Field |
| ppt | parts per trillion |
| PA | Preliminary Assessment |
| PFAS | per- and polyfluoroalkyl substances |
| PFBS | perfluorobutane sulfonate |
| PFOA | perfluorooctanoic acid |
| PFOS | perfluorooctane sulfonate |
| RI | Remedial Investigation |
| RPM | Remedial Project Manager |
| RSL | Regional Screening Level |
| SDWA | Safe Drinking Water Act |
| UEM | Urban & Environmental Management |
| USEPA | United States Environmental Protection Agency |
| VSI | visual site inspection |
| WWTP | wastewater treatment plant |

SECTION 1

# Introduction

The Department of the Navy (Navy) Environmental Restoration Program at Naval Air Station (NAS) Whidbey Island, which is within the Naval Facilities Engineering Command (NAVFAC) Northwest Division, contracted with CH2M HILL, Inc. (CH2M) to perform preliminary assessment (PA) activities at all NAS Whidbey Island installations (Ault Field, Outlying Landing Field (OLF) Coupeville, and Seaplane Base) to determine probable environmental release of per- and polyfluoroalkyl substances (PFAS). This report focuses on Seaplane Base – specifically, completing PA activities to identify locations at Seaplane Base where PFAS may have been released into the environment and to provide an initial assessment of possible migration pathways and potential receptors of contamination. This work is being performed under Comprehensive Long-term Environmental Action—Navy (CLEAN) 9000 Contract N62470-16-D-9000, Contract Task Order 4041.

CH2M visited Seaplane Base during November and December 2017. Seaplane Base is an active Navy installation in the City of Oak Harbor, Washington. The location of the NAS Whidbey Island installations including Seaplane Base are shown on **Figure 1-1** and the potential PFAS release locations identified at Seaplane Base during this PA are shown on **Figure 1-2.**

## 1.1 Background

PFAS have been identified in a variety of commercial and industrial sources and widely used since the 1970s, including as ingredients in aqueous film forming foam (AFFF), which was utilized by the Navy for fire training exercises, fire suppression systems, and suppressing aircraft fires or other fires. The Military Specification for AFFF (MIL-F-24385) was formally issued on November 21, 1969. AFFF suppresses combustion by coating the fuel source of the fire, preventing oxygen from entering. Areas located within Seaplane Base may have used, stored, or disposed of AFFF during historical operations. Currently, fire trucks with AFFF tanks are parked at the Seaplane Base fire station.

PFAS have been identified by United States Environmental Protection Agency (USEPA) as emerging contaminants. The Department of Defense (DoD) has identified these chemicals as contaminants that have a reasonably possible pathway to enter the environment, present a potential unacceptable human health or environment risk, and lack or have evolving published regulatory standards (Navy, 2017). As detailed in the NAVFAC Interim PFAS Site Guidance, there are no Safe Drinking Water Act (SDWA) federal regulations or Clean Water Act Ambient Water Quality Human Health Criteria for any PFAS.

For contaminants not subject to national primary drinking water regulation, the SDWA authorizes the USEPA to publish nonregulatory lifetime health advisories (LHAs) or take other appropriate actions. These LHAs are created to assist state and local officials in evaluating risks from these contaminants in drinking water. In May of 2016, the USEPA issued an LHA for two PFAS, specifically perfluorooctanoic acid (PFOA) and perfluorooctane sulfonate (PFOS).

Each LHA was established as 70 parts per trillion (ppt) or 0.07 microgram per liter (µg/L). An additional LHA of 70 ppt was established for the total concentration of PFOA and PFOS combined when both PFOA and PFOS have been detected. Additionally, a risk-based Regional Screening Level (RSL) has been set for one other PFAS compound, perfluorobutane sulfonate (PFBS). As of June 2017, this level was 400 µg/L (400,000 ppt) for tap (drinking) water (USEPA, 2017).

PFAS are chemically and biologically stable, and resist natural degradation processes; therefore, they persist in the environment. Recognized sources of PFAS in groundwater and soil include (NGWA, 2017):

- Storage, transfer, and use of AFFF for firefighting and fire training
- Disposal and land application of biosolids (treated and solid waste)

- Discharge of effluent from municipal wastewater treatment systems
- Release from landfill leachate
- Release from commercial and industrial sources

## 1.2 Purpose and Objectives

The purpose of this PA Report is to assess potential PFAS releases into the environment at Seaplane Base. Specific objectives are to:

- Identify locations related to the potential use, storage, and disposal of AFFF.
- Provide initial overview of potential contaminant migration pathways from areas where AFFF was potentially used and identify potential receptors that may be exposed.
- Provide recommendations for areas requiring further investigation.

This PA Report identifies and documents known fire training areas (FTAs), as well as non-fire training locations where PFAS may have been released into the environment (**Table 1-1**). No historical or current FTAs were identified at Seaplane Base.

Table 1-1. Fire Training Areas and Non-Fire Training Areas Identified for Potential PFAS Releases
*NAS Whidbey Island Seaplane Base, Washington*

| **Fire Training Areas** |
|---|
| (No FTAs were identified) |
| **Non-Fire Training Areas** |
| ***Hangars/Buildings*** |
| Former Nose Hangar |
| Vehicle Maintenance – Building 18 |
| ***Fire Station*** |
| Building 16 |
| ***Waste Water Treatment Plants*** |
| Sanitary Wastewater Treatment Plant (WWTP) |
| ***Landfills*** |
| Seaplane Base Landfill |
| ***Other*** |
| Biosolids Land Application Area |

## 1.3 Preliminary Assessment Methods

This PA was conducted in accordance with the USEPA's *Guidance for Performing Preliminary Assessments under CERCLA* (USEPA, 1991) with additional guidance from the Navy's *Interim Per-and Polyfluoroalkyl Substances (PFAS) Site Guidance for NAVFAC Remedial Project Managers (RPMs)/ September 2017 Update* (Navy, 2017). The following activities were completed as part of this PA:

- Existing site documentation was reviewed to identify and characterize potential PFAS storage, use, and disposal.
- Relevant site personnel were interviewed to identify and characterize potential PFAS storage, use, and disposal activities.
- A visual site inspection (VSI) was conducted to identify evidence of PFAS storage, use, and disposal, to fill data gaps identified in the preliminary review. Physical site characteristics (e.g., surface flow, drainage conditions) were documented for those areas identified during the preliminary review and interviews.
- Environmental data records were reviewed to identify nearby populations, drinking water sources, and environmentally sensitive areas.

The activities above, as well as conclusions and recommendations for each potential PFAS release area are summarized in this report. Potential PFAS exposure routes were also evaluated, with consideration of current and potential future land and groundwater use.

## 1.4 Report Organization

This PA contains the following sections:

- **Section 1 – Introduction,** describes the background, purpose, and organization of the report.
- **Section 2 – Background,** describes facility and relevant history.
- **Section 3 – Archive Sources,** identifies the sources of information used to identify and assess potential PFAS release areas.
- **Section 4 – Identification and Assessment of Potential PFAS Release Areas,** presents each potential release area along with a description and operational history; PFAS storage, use, or release; and a pathway and environmental hazard assessment.
- **Section 5 – Conclusions and Recommendations,** summarizes the findings of this PA and makes recommendations regarding future actions.

SECTION 2

# Background

## 2.1 Facility Description and Background

NAS Whidbey Island is located at the juncture of Puget Sound and the Strait of Juan de Fuca, which is approximately 100 miles north of Seattle. NAS Whidbey Island includes Ault Field, Seaplane Base, and Outlying Landing Field Coupeville (**Figure 1-1**). This PA focuses on Seaplane Base.

Seaplane Base is adjacent to the eastern border of the town of Oak Harbor, which has a population of 23,204 (U.S. Census Bureau, 2016). Seaplane Base occupies 2,688 acres and is bordered by residential and farming communities to the north and east, the town of Oak Harbor to the west, and Crescent/Oak Harbors to the south (**Figure 1-2**). Seaplane Base was commissioned in 1942 and was constructed using dredged fill from Oak and Crescent Harbors. The Patrol Bomber Catalina, which resembled a large flying boat, began operations from Seaplane Base in December 1942.

Although flight operations ceased by the mid-1960s, Seaplane Base continued operational support of Ault Field, including a constructed fuel farm (removed in 1990s), housing, and storage areas. Currently, Seaplane Base contains the Family Services Center, Commissary, Navy Exchange, family housing and lodge, sanitary wastewater treatment plant, gas station, vehicle maintenance facility, fire station, and storage facilities. All fire training at NAS Whidbey Island occurred at Ault Field and no evidence of AFFF spray test areas or buildings with AFFF fire suppression systems were identified at Seaplane Base. Furthermore, no emergency response actions requiring AFFF use were identified.

## 2.2 Environmental Setting

### 2.2.1 Geologic Setting

#### Whidbey Island Geology

Whidbey Island lies within the Puget Lowland, a topographic and structural depression between the Olympic Mountains and the Cascade Range. The geology of the area is heavily influenced by glacial advances and retreats. At the height of the most recent glaciation, ice is estimated to have reached a thickness of about 4,500 feet in the Oak Harbor area. The geologic units of Whidbey Island consist of a sequence of Quaternary-age (less than 2 million years old) glacial and interglacial deposits that may be over 3,000 feet thick (USGS, 1985). The near-surface deposits are mostly glacial sediment of the most recent Fraser glaciation (20,000 to 10,000 years old).

The glacial and post-glacial sediments, and artificial fill make up most of the surface and near-surface soil underlying the base. In general, these stratigraphic units consist of relatively impermeable clay, silt, and silty fine sand and gravels (Everson glaciomarine drift and Vashon till), with interbedded layers of sands and gravels. Interbedded sands and gravels were deposited by retreating glaciers. Along the coastline these sediments have been reworked into sandy beach deposits. Low-permeability Cretaceous or Tertiary bedrock (older than 30 million years) underlies the unconsolidated Quaternary deposits (USGS, 1988a).

The thickness of the Quaternary deposits is up to 3,000 feet in the central part of Whidbey Island. The configuration of the underlying bedrock influences the thickness of the deposits. The buried erosional surface of the bedrock, tilted fault blocks, and unidentified faults influence the thickness of Quaternary deposits (i.e., down-thrown fault blocks underlie the thickest surficial deposits). Quaternary deposits are relatively thick in the vicinity of Seaplane Base because the area overlies a down-thrown fault block.

USGS (2005) interpreted several northwest-trending strands of the Utsalady Point Fault that run through Seaplane Base. These fault strands are interpreted to be active and offset the Quaternary-age surficial deposits.

### Seaplane Base Geology

Seaplane Base is generally level and ranges from 0 to 50 feet above mean sea level (msl). The stratigraphy of the base generally consists of glaciomarine drift overlying Vashon till and advance outwash (Shannon and Wilson, 1978; USGS, 1986). The low-lying marsh area north of Crescent Harbor generally contains organic-rich silt and clay. The narrow strip of land that connects Whidbey Island to the Maylor peninsula was originally a tombolo (narrow sandy strip of land, **Figure 1-2**).

## 2.2.2 Hydrogeologic Setting

### Whidbey Island/Seaplane Base Hydrogeologic Setting

Groundwater on Whidbey Island is present within the glacial deposits. Precipitation and accumulated surface water infiltrate to become groundwater. Groundwater moves from recharge areas on land surface, downward through aquifers, and towards discharge areas. Recharge comes primarily from precipitation that infiltrates downward, mostly during winter and spring. The recharge varies throughout the area and is a function of precipitation, temperature, land use, soil type, and vegetation. Discharge areas include springs above and below msl, and pumped wells.

The physical characteristics of the glacial deposits influence the aquifer characteristics. Advancing glaciers deposited a compact mixture of clay, silt, sand, and gravel (till). In addition, the glaciers dammed several large streams which formed numerous lakes. The streams deposited thick layers of clay and silt into these lakes. These dense, low-permeability layers of till and stratified lake deposits act as the confining layers between aquifers. Conversely, meltwater streams that issued from retreating glaciers typically deposited coarse-grained sands and gravels (outwash). These high-permeability layers form the aquifers in the area. Offset of these Quaternary deposits, most notably of sandy layers that host the aquifers, could create impermeable barriers that influence aquifer configuration and thickness, and restrict groundwater movement.

The sand and gravel units below the water table yield water to production and domestic wells. USGS (1988b) divided the deposits generally into five aquifers and five confining units that extend to 900 feet below msl. Groundwater moves from the shallowest aquifer downward into the deeper aquifers. The sand and gravel deposits that are from 30 feet above msl to 200 feet below msl appear to be more continuous than the shallower deposits, and most of the wells on the island tap these deposits. This aquifer is called the “sea-level aquifer” and is essentially the second highest aquifer (the elevation of the top of the sea-level aquifer in the site vicinity is roughly sea level). Data suggest that the sea-level aquifer is continuous across the major tectonic features on Whidbey Island. The sea-level aquifer is very productive and contains many production wells; consequently, few wells penetrate the deeper sand and gravel units (USGS, 1982).

A near-surface, unconfined aquifer exists closer to Seaplane Base (URS, 1993). This unconfined aquifer contains surficial dredged materials and the shallow underlying sediments appear to behave as a single aquifer. A monitoring well drilled to 67 feet below ground surface identified the “base” of the uppermost aquifer, where the lithology changed to silty sand with clay and acts as an aquitard.

Tidal forces also influence groundwater flow, especially in the low-lying area north of Crescent Harbor. Based on groundwater level measurements (URS, 1993), the groundwater flow direction is generally to the south. However, the groundwater elevation changes with the tides and the degree of change and lag times in groundwater levels appears to be inversely related to the distance of the wells from Crescent Harbor. Additionally, because most of the wells on Whidbey Island pump from the sea-level aquifer, pumping levels are below msl for most of the major wells. This indicates that lateral seawater intrusion

towards pumping wells threatens water quality in the vicinity of Seaplane Base and Oak Harbor (URS, 1993).

Groundwater at Seaplane Base within the fill material between Whidbey Island and the Maylor peninsula flows due west towards the Oak Harbor shoreline. A groundwater divide is likely present between this area and areas to the east where groundwater flows to the east towards Crescent Harbor. The groundwater in the area along the north shore of Crescent Harbor varies due to tidal influences, but generally flows to the south to Crescent Harbor.

### 2.2.3 Hydrologic Setting

Annual precipitation is approximately 19 inches; however, surface runoff is minimal due to the high rate of evapotranspiration (URS, 1993). Most of the surface water in the developed areas of the base flows across paved areas and into storm drains before discharging into outlets into Oak and Crescent Harbors.

## 2.3 Ecological Habitat and Receptors

The Remedial Investigation (RI) Report (URS, 1993) indicated several ecosystems are present at NAS Whidbey Island. Habitats include mixed evergreen forests, brush and grasslands, freshwater wetlands, saltwater marshes, beach and coastal zones, and agricultural lands. The predominate habitat is coniferous forests, principally Douglas-fir and grass/brushland. Seaplane Base encompasses 800 acres of forested land and 500 acres of grasslands, brushlands, and wetlands. Furthermore, the occurrence of ecological receptors in the study area's surrounding area, including Ault Field, Seaplane Base, and OLF Coupeville are presented in the Environmental Impact Statement for EA-18G “Growler” Airfield Operations (Navy, 2016a). The findings are summarized in the following subsections.

### 2.3.1 Federally Threatened and Endangered Species

There are nine federally listed terrestrial species that could potentially occur at Seaplane Base and the surrounding area (Navy, 2016a). These are:

- Golden paintbrush (plant, threatened)
- Taylor’s checkerspot butterfly (invertebrate, endangered)
- Island marble butterfly (invertebrate, candidate)
- Oregon spotted frog (amphibian, threatened)
- Marbled murrelet (bird, threatened)
- Northern spotted owl (bird, threatened)
- Streaked horned lark (bird, threatened)
- Yellow-billed cuckoo (bird, threatened)
- North American wolverine (mammal, proposed threatened)

### 2.3.2 Other Fish and Wildlife Species

Reptile and amphibian species potentially occurring in the study area encompassing Ault Field, Seaplane Base, OLF Coupeville, and the surrounding areas include several species of lizards, snakes, salamanders, and frogs. Birds occurring in the study area include about 230 migratory bird species protected under the Migratory Bird Treaty Act. Six common year-round bird species may also occur, including the ring-necked pheasant (*Phasianus colchicus*), rock pigeon (*Columba livia*), Eurasian collared-dove (*Streptopelia decaocto*), European starling, and house sparrow (*Passer domesticus*), and the California quail (*Callipepla californica*). Thirty-six species of terrestrial mammal were identified as potentially occurring in the study area. Large mammals that regularly occur are the Columbian black-tailed deer (*Odocoileus hemionus columbianus*) and the coyote (*Canis latrans*), which occur in the mixed forest, alder forest, and freshwater marsh habitat types, as well as in grasslands. The eastern cottontail (*Sylvilagus floridanus*),

European rabbit (*Oryctolagus cuniculus*), river otter (*Lontra canadensis*), mink (*Mustella vison*), opossum (*Didelphis virginiana*), raccoon (*Procyon lotor*), Douglas squirrel (*Tamiasciurus douglasii*), Townsend's vole (*Microtus townsendii*), masked shrew (*Sorex cinereus*), and deer mouse (*Peromyscus maniculatus*) also are among the most commonly occurring mammals within the study area. Bat species are also common.

Intertidal zones also support a wide diversity of organisms. Many fish and marine mammals live in the marine areas that surround NAS Whidbey Island (Navy, 2016a). According to a Navy report (Navy, 1988), Seaplane Base intertidal zone provides habitat for cockleshells, eastern softshell clams, littleneck clams, butter clams, horse clams, oysters, and geoducks. Historical recreational shellfish collection has been known to occur within intertidal areas surrounding the Seaplane Base (https://www.doh.wa.gov/CommunityandEnvironment/Shellfish/BeachClosures; URS, 1993).

## 2.4 Water Usage

Because of the proximity to Puget Sound, groundwater at Seaplane Base is tidally influenced and brackish, and therefore is not a suitable source of potable water. The primary source of fresh water is supplied to the City of Oak Harbor and Seaplane Base from the City of Anacortes located on the mainland 16 miles to the north via a pipeline (URS, 1993).

Some residents upgradient of Seaplane Base to the north have private water supply wells but these are completed several hundred feet below ground surface within the sea-level aquifer, with the nearest well approximately 1.3 miles away (**Section 2.3.1**). In addition, Whidbey Island County Department of Health regulations prohibit the installation of private or public drinking water wells within 100 feet of the mean high tide levels to diminish the likelihood of saltwater intrusion.

SECTION 3

# Archive Sources

This section summarizes the sources of information used to perform the PA.

## 3.1 Preliminary Review

Information was gathered and evaluated during the preliminary review to identify and characterize locations of potential PFAS storage, use, or disposal, and to focus the activities to be conducted during the VSI. The information was obtained from existing documents and interviews conducted with relevant individuals. A summary of information reviewed is provided as **Appendix A**.

### 3.1.1 Document Review

#### Internet Records

Internet search engines were utilized to find historical information on crashes, fires, use of AFFF, and spills at Seaplane Base. Additionally, the National Archives Catalog was queried to obtain relevant historical documents. The Washington Department of Ecology website (WDOE, 2017) was searched for records of groundwater supply wells located near Seaplane Base.

#### Facility Operations Records

Navy staff provided inventory lists for aboveground and underground storage tanks and buildings at the facility. The building inventory list provided in the geographic information system (GIS) database included the names of the buildings which aided in selection of locations that had the potential for PFAS storage, use, or disposal.

#### Environmental Reports

Several reports that document past environmental investigations were reviewed for PFAS-related information pertaining to the use, storage, or release of AFFF at Seaplane Base. These reports included the 1993 RI report (URS, 1993) and the 2016 Third 5-Year Review report (Navy, 2016b). A document review list is provided in **Appendix A**. Additional information from these reports was gathered to identify whether any receptors (with consideration of reasonably anticipated current and future land and water use) or habitats (e.g., waterways) may have been affected by AFFF releases.

#### Environmental Restoration Program Records

Environmental Restoration Program reports from the Administrative Record were searched for key terms to identify potential PFAS release areas and to obtain information on physical investigations and identification of potential pathways and receptors at those areas.

#### Interviews

CH2M conducted interviews with current and former NAS Whidbey Island personnel to gather pertinent information regarding the history and operations at NAS Whidbey Island, including Seaplane Base. The goal of these interviews was to validate and verify data collected during document and record reviews, and also to identify other information related to PFAS not previously found in historical documents. Interviews with specific information related to Seaplane Base are referenced in **Section 4.**

The interviews were conducted in person, by telephone, or via email. Each interview session was logged using an Interview Log Sheet (**Appendix B**). Completed log sheets are provided in **Appendix B**. The information from the interviews was also used to confirm and select additional locations to observe during site visits. This information is referenced throughout **Section 4**.

The following personnel were interviewed:

- Retired Director of Research, Principal Investigator for International Arrow, and Goal Technologies
- Regional Hazardous Waste Program Manager
- NAVFAC Northwest Urban & Environmental Management (UEM) Civil Engineer
- NAVFAC Northwest Public Works, Hazardous Waste Manager
- NAS Whidbey Island Fire Chief, 2008 to present
- NAS Whidbey Island Crash Captain, 1985 to 2001
- NAS Whidbey Island Advanced Emergency Medical Technician (AEMT)/Firefighter
- Regional Fire Chief, Navy Region NW, 2008 to present; NAS Whidbey Island Fire Chief, 1999 to 2006
- NAVFAC Northwest Public Works Commander

## 3.2 Visual Site Inspection

The VSI was conducted on November 15, 2017. The information obtained during the review/interview process was used to identify potential PFAS-related areas for the VSI. All identified, accessible areas were visited to inspect for signs of potential AFFF releases such as surficial debris, stained soils, areas devoid of vegetation or with stressed vegetation; to locate receptors and distances from potential releases; and to identify significant topographical features affecting local drainage patterns and overland flow routes to nearby surface water bodies. The areas identified for the VSI (potential PFAS release areas) are shown on **Figure 1-2** and are discussed in more detail in **Section 4**. Field notes obtained during the VSI are provided in **Appendix C**.

SECTION 4

# Identification and Assessment of Potential PFAS Release Areas

This section summarizes the characteristics of each area at Seaplane Base identified for the VSI; the potential for PFAS to have been stored, used, or released at each area; and assesses the migration pathways and potential exposures that could result from a PFAS release. If no PFAS storage, use, or release was identified at an area, the potential migration pathways and exposures were considered incomplete and were not evaluated.

A complete exposure pathway typically includes the following components: a source of contamination (an environmental medium contaminated at the source or a release mechanism by which chemicals are released from a source medium and transported), an exposure medium by which a receptor comes into contact, and a route of intake for the contaminant into the receptor's body. If any of these elements are missing, the pathway is incomplete. Other release mechanisms resulting in exposure media for receptors may include the uptake of soil contaminants by plants and animals and the emission of soil contaminants into the air in association with dust particles (USEPA, 1989).

## 4.1 Fire Training Areas

No fire training areas are currently or were historically present at Seaplane Base.

## 4.2 Hangars/Buildings

### 4.2.1 Former Nose Hangar

The following sections describe the assessment of potential PFAS release at the former Nose Hangar.

#### Description and Operational History

The former Nose Hangar served as a seaplane service and maintenance center during the 1940s and 1950s that included steam cleaning, a high-pressure wash rack, and drainage collection sump (**Figure 4-1**). The hangar was demolished in the late 1950s to early 1960s (URS, 1993). The location of the former Nose Hangar is currently used as an open concrete parking lot (**Figure 4-1**). The geographic coordinates are 48°17'15.20" N and 122°37'51.18" W.

#### PFAS Storage, Use, or Release

The Military Specification for AFFF (MIL-F-24385) was formally issued in late 1969. Since the former Nose Hangar was demolished before 1969, no potential release of PFAS to the environment exists.

#### Pathway and Environmental Hazard Assessment

Not applicable.

### 4.2.2 Vehicle Maintenance Building

The following sections describe the assessment of potential PFAS release at the vehicle maintenance building.

#### Description and Operational History

The vehicle maintenance building, Building 18, is located on the peninsula of Seaplane Base northwest of the intersection of Coral Sea Avenue and Tulagi Avenue (**Figure 4-1**). The building is surrounded by a

large concrete parking lot with small areas of grass to the east, south, and west. There is one storm drain inlet located on the north side of the building. The building is currently and was historically used for vehicle maintenance, including maintenance of fire trucks (Regional Fire Chief, 2017, pers. comm., **Appendix A**). There were no storm drain GIS data or as-built drawings available during the PA review period. The date of construction of the building could not be determined. The geographic coordinates are 48°17'05.29" N and 122°37'45.48" W.

## PFAS Storage, Use, or Release

No formal records of AFFF storage, use, or release were identified during the review and no visual signs of a release were noted during the VSI. However, during the VSI, Fire Trucks 35 and 37 were parked at the building, each with 210 gallons of AFFF in their holdings tanks, according to Navy inventory list. It was unknown if the fire trucks were parked there for maintenance or for other purposes. The number of fire trucks and parking frequency at the building is unknown.

Fire trucks could potentially have AFFF residue from manually filling of the AFFF holding tanks on the fire trucks using 5-gallon buckets. Refilling of the AFFF tank on fire trucks typically occurs at Ault Field, but isolated filling at the storm drain inlet ("wash rack") may have occurred (Regional Fire Chief, 2017, pers. comm., **Appendix A**). After AFFF filling activities, the fire trucks could have been washed at the same storm drain inlet potentially releasing AFFF residue to the environment (Regional Fire Chief, 2017, pers. comm., **Appendix A**). The frequency of filling fire trucks with AFFF was very low since AFFF is rated to last 25 years. In addition, the risk manual states that loading of AFFF was reduced by the introduction of an automatic loading apparatus which keeps the AFFF within tubing during the transfer from the storage tank into the AFFF tank on the fire truck.

VSI of the vehicle maintenance building did not identify a designated wash rack for vehicles. However, a large storm drain inlet located north of the building was observed and confirmed by NAS Whidbey Island personnel to have been used as the wash rack. Based on the information provided, it is possible that small releases of PFAS occurred during fire truck washing activities.

## Pathway and Environmental Hazard Assessment

The pathway and environmental hazard assessment includes analyses of groundwater, surface water, sediment, soil, and air pathways and targets.

Database research shows 19 daycare facilities, 10 nursing homes, 12 schools, 3 colleges, and 2 hospitals are located within a 4-mile radius from the building. There is one elementary school and one day-care located on base. These locations are located approximately 2 miles and 1 mile from the vehicle maintenance building, respectively. However, these areas are all upgradient of the building to the north and not in the potential migration path from potential PFAS release. The paved wash areas do not provide suitable habitat to support ecological resources.

### Groundwater Pathway and Targets

AFFF residue removed during fire truck washing activities would likely have migrated on the concrete to the storm drain inlet, through the storm drain inlet, and then likely to an outfall in Oak Harbor. Since there were no GIS data or as-built drawings available, the route of water once it enters the storm drain inlet is unknown. There are no apparent overflow outfalls, stormwater drainage ditches, or surface connections to the adjacent harbor. The condition of the storm drain is unknown and, if the conditions of the infrastructure is poor, then it is possible that leaking prior to discharge into the Oak Harbor could infiltrate into the ground and migrate to the underlying aquifer. Because of the proximity to Puget Sound, the groundwater is tidally influenced and brackish, therefore not a potential source of potable water. As stated in **Section 2.4**, groundwater is not used as a potable source due to the tidal influence, brackish quality, and environmental regulations, thus there is no complete groundwater pathway.

**Surface Water and Sediment Pathways and Targets**

AFFF residue removed during fire truck washing activities would likely have migrated on the concrete to the storm drain inlet, through the storm drain inlet, and then likely to an outfall in Oak Harbor. Since there were no GIS data or as-built drawings available, the route of water once it enters the storm drain inlet is unknown. There are no known outfalls, stormwater drainage ditches, or surface connections to Oak Harbor, although it is likely that the storm drain discharges to Oak Harbor. Oak Harbor is an open water environment connected to the Saratoga Passage, where fisheries are present (**Figure 1-1**).

Oak Harbor (located 600 feet to the west) and Crescent Harbor (1,400 feet to the east) are the only water bodies that could be encountered during a migration from the storm drain inlet. If historical releases of contaminants to the harbor have occurred, then exposure to contaminated sediment by aquatic resources (primarily benthic and epi-benthic organisms) is possible.

**Soil and Air Pathways and Targets**

AFFF residue from the fire truck washing activities would likely have migrated on the concrete to the storm drain inlet, through the storm drain, then likely to an outfall in Oak Harbor. Since there were no GIS data or as-built drawings available, the route of water once it enters the storm drain inlet is unknown. There are no known discharges to soil or air. Therefore, soil and air exposure pathways are incomplete.

# 4.3 Fire Stations

## 4.3.1 Fire Station (Building 16)

The following sections describe the assessment of potential PFAS release at Seaplane Base Fire Station.

### Description and Operational History

Seaplane Base Fire Station, Building 16, is located on the peninsula of Seaplane Base northwest of the intersection of Coral Sea Avenue and Tulagi Avenue (**Figure 4-1**). The building is surrounded mainly by grass, with one concrete parking area and concrete ramp for access to the truck bays. The building has always been the fire station since the Base construction during the early 1940s. Typically, there is one fire truck located at the station (Regional Fire Chief, 2017, pers. comm., **Appendix A**). The geographic coordinates are 48°17’04.98” N and 122°37’41.98” W.

### PFAS Storage, Use, or Release

At least one fire truck containing an AFFF tank is stationed at Building 16 (Regional Fire Chief, 2017, pers. comm, **Appendix A**). However, no formal records of AFFF storage, use, or release were identified during the review and there were no visual signs of release. As described in **Section 4.2.2**, refilling of the AFFF tank on fire trucks typically occurs at Ault Field, but isolated filling of trucks assigned to the Seaplane Base Fire Station may have occurred at the wash rack area (stormwater inlet) located at the adjacent Vehicle Maintenance Building (Regional Fire Chief, 2017, pers. comm., **Appendix A**). No wash racks or stormwater inlets were identified during the VSI at the fire station. The storm drain inlet that was used as a wash rack for cleaning fire trucks is located adjacent of the Fire Station at the Vehicle Maintenance Building (Regional Fire Chief, 2017, pers. comm., **Appendix A**).

As described in detail in **Section 4.2.2,** AFFF filling activities and washing of residual PFAS may have occurred at the storm drain inlet (Regional Fire Chief, 2017, pers. comm., **Appendix A**). No fire trucks were present during the site visit, but two fire trucks (35 and 37) were parked at the adjacent vehicle maintenance building. Based on limited evidence of use or spills at the Seaplane Base, no potential for PFAS release was identified at this location.

### Pathway and Environmental Hazard Assessment

Not applicable.

## 4.4 Emergency Response

No documented emergency responses with the use of AFFF were identified.

## 4.5 AFFF Spray Test Areas

No documented AFFF spray test areas were identified.

## 4.6 Wastewater Treatment Plant

### 4.6.1 Seaplane Base Sanitary Wastewater Treatment Plant

The following sections describe the assessment of potential PFAS release at Seaplane Base sanitary WWTP.

#### Description and Operational History

The sanitary WWTP, which included two lagoons, was constructed in 1960 to treat wastewater from Navy housing on Seaplane Base (**Figure 4-2**) (UEM Civil Engineer, 2017, pers. comm., **Appendix A**). The WWTP is a lagoon system with a headworks and effluent polishing and discharges to Crescent Harbor through an outfall. The solids are sent to the Island County Landfill for disposal (UEM Civil Engineer, 2017, pers. comm., **Appendix A**). In 1987, the Navy entered an agreement with the City of Oak Harbor to run the Seaplane Base sanitary WWTP for both communities. The City of Oak Harbor and the Navy have both invested in many WWTP improvements and expansions over the years. (UEM Civil Engineer, 2017, pers. comm., **Appendix A**). The geographic coordinates are 48°17’57.88” N and 122°37’51.44” W.

#### PFAS Storage, Use, or Release

No formal records of AFFF storage, use, or disposal were identified during the review of this area. It is not known if any floor drains from buildings flow to the WWTP. The stormwater drain inlets connect to retention basins and not the WWTP. There was no anecdotal evidence that disposal of AFFF occurred at the Seaplane Base WWTP. In addition, groundwater is not used as a potable source because of the tidal influence, brackish quality, and environmental regulations.

During the site interview, it was determined that AFFF was potentially sprayed in the WWTP lagoons for disposal. Based on this information provided by the NAVFAC Northwest Public Works Hazardous Waste Manager, Mr. Hardy, follow-up email communications were conducted to confirm possible spraying and disposal of AFFF at Seaplane Base WWTP lagoons. Mr. Hardy confirmed that AFFF was only disposed in Ault Field, and not Seaplane Base.

Based on the information provided, there is no potential for PFAS release at this location.

#### Pathway and Environmental Hazard Assessment

Not applicable.

## 4.7 Landfills

### 4.7.1 Seaplane Base Landfill

The following sections describe the assessment of potential PFAS release at Seaplane Base Landfill.

### Description and Operational History

The former Seaplane Base Landfill was located at the southeast intersection of Torpedo Road and Midway Boulevard and was approximately 1.5 acres in size (**Figure 4-2**). The landfill received solid and industrial wastes from on-base support and maintenance activities from 1945 to 1955 (URS, 1993). The geographic coordinates are 48°17’57.88” N and 122°37’51.44” W.

### PFAS Storage, Use, or Release

Former Seaplane Base Landfill was closed prior to the formal issue of Military Specification for AFFF (MIL-F-24385) in late 1969. Therefore, no potential PFAS release to the environment exists.

### Pathway and Environmental Hazard Assessment

Not applicable.

# 4.8 Other Sites

## 4.8.1 Biosolids Land Application Area

### Description and Operational History

The biosolids land application area is located east of the munitions storage area and encompasses 2.3 acres of land. (**Figure 4-3**). The land application area is secured due to nearby munitions storage areas and consists of an open field area with trees to the north and east and Crescent Bay to the south and west. The biosolids were applied in 2015 and in 2017 with approximately 400 cubic yards of material during each year (Hazardous Waste Manager, 2017, pers. comm., **Appendix A**). The geographic coordinates are 48°17’41.56” N and 122°34’10.82” W.

### PFAS Storage, Use, or Release

No formal records of AFFF storage, use, or release were identified during document review. No site visit occurred at this location due to access restrictions near munitions storage areas. In 2014, an AFFF release of approximately 500 gallons (1/8 gallon AFFF and 500 gallons of water) occurred at Ault Field and was potentially disposed of at the Ault Field WWTP (Hazardous Waste Manager, 2017, pers. comm., **Appendix A**). Biosolids from the Ault Field WWTP were land applied at multiple locations within NAS Whidbey Island, including east of the munitions storage area at Seaplane Base, in 2015 and 2017 (Hazardous Waste Manager, 2017, pers. comm., **Appendix A**). Future disposal of biosolids at the land application area is planned once a year (Hazardous Waste Manager, 2017, pers. comm., **Appendix A**). The location, identified in **Figure 4-3,** received approximately 800 cubic yards of biosolids material from Ault Field WWTP (Hazardous Waste Manager, 2017, pers. comm., **Appendix A**). Based on the operational history of the Ault Field WWTP, there is a potential of PFAS discharge to the environment at the biosolids land application area.

### Pathway and Environmental Hazard Assessment

Database research shows 19 daycare facilities, 10 nursing homes, 12 schools, 3 colleges, and 2 hospitals are within a 4-mile radius from the building. There is one elementary school and one daycare located on-base. These locations are approximately 1.3 miles northwest and 3 miles west of the building, respectively. However, these areas are all upgradient to the northwest or cross-gradient (west) of the land application area and not in the potential migration path from potential PFAS release.

**Groundwater Pathway and Targets**

AFFF remaining in the biosolids potentially could be leached from the material and migrate into the aquifer. However, because the land application area is close to Puget Sound, the groundwater is tidally

influenced and brackish. Review of historical records and water use indicates that no infrastructure was developed due to poor quality of groundwater.

Residents located upgradient (northwest) of land application area have water supply wells that are completed in the confined sea-level aquifer (URS, 1993), with the closest being 2.3 miles away. As stated in **Section 2.4**, groundwater is not used as a potable source due to the tidal influence, brackish quality, and environmental regulations, there is no complete groundwater pathway.

**Surface Water and Sediment Pathways and Targets**

The biosolids land application area is open and can generally be described as flat and devoid of vegetation. Surface water drainage from this area is assumed to flow south toward Crescent Harbor where the vegetation becomes denser near the road that separates the field area from Crescent Harbor (700 feet), where fisheries are present. Crescent Harbor is an open water environment connected to the Saratoga Passage (**Figure 1-1**). There are no apparent constructed or natural surface water drainages. Ingestion or dermal exposure for ecological receptors to surface water prior to infiltration could potentially occur. Crescent Harbor occurs downgradient of the biosolids land application area. The nearest wetland area is approximately 4,000 feet upgradient to the northwest. Access to the biosolids land application area is restricted; therefore, recreational use is unlikely.

If surface water runoff containing contaminants from the biosolids land application area reaches Crescent Harbor, then exposure to contaminated sediment by aquatic resources (primarily benthic and epi-benthic organisms) could occur.

**Soil and Air Pathways and Targets**

PFAS-contaminated biosolids may have been historically deposited at the biosolids land application area. Land application of biosolids from the WWTP still occurs within this area. As depicted on **Figure 4-3,** the area is largely devoid of vegetation. Only transient wildlife use of the area is expected because there is little cover or food resources. The closest residential area is approximately 8,000 feet from approximately 400 Navy housing units to the northwest, and there are no schools or daycare facilities within a 200-foot radius of the area. This is a highly secured area due to the proximity of the munitions storage; therefore, recreational use in the area would not occur. However, exposures to fugitive dust emissions is possible for periodic maintenance workers.

SECTION 5

# Conclusions and Recommendations

This PA Report identified six areas that were evaluated for potential PFAS releases. No areas appeared to pose an immediate risk to human health and the environment. Groundwater is not used as a potable source due to the tidal influence, brackish quality, and environmental regulations. All private groundwater wells are located upgradient of Seaplane Base with the nearest being 1.3 miles to the north.

Although there are no imminent risks to identified receptors, the assessment identified several areas of possible AFFF release to the environment. Records researched as part of this PA identified a number of potential future receptors that could be impacted by PFAS present in environmental media from possible releases. In accordance with DoD Instruction 4715.18, *Emerging Contaminants* (June 2009, certified through June 2016), DoD policy requires that "Risks to people, the environment, and DoD missions, programs, and resources shall be assessed and, when appropriate, actions shall be taken to reduce risks related to ECs [emerging contaminants] development, use, or release." Additionally, Navy *Interim Per- and Polyfluoroalkyl Substances (PFAS) Site Guidance for NAVFAC Remedial Project Managers (RPMs)/September 2017 Update* (Navy, 2017) recommends:

"RPMs should consider investigating ER sites for PFAS when the conceptual site model (CSM) indicates:

a. Historical release or use of aqueous film forming foam (AFFF), or

b. Historical use of an area for other industrial activities (e.g., plating operations) that may have released PFAS.

Based on recent Navy experience, sites at Naval and Marine Corps Air Stations (NAS and MCAS respectively), including outlying or auxiliary landing fields, other applicable installations with potential repeated (e.g., former firefighting training areas) or significant (e.g., crashes) AFFF releases should be prioritized for investigation."

This PA Report has identified sites that meet the first criteria, triggering the need for further investigation to determine whether a release to the environment occurred resulting in impacts to soil, sediment, surface water, or groundwater at levels that warrant remedial actions.

Two locations (Building 18 and Biosolids Land Application Area) are recommended for additional investigation based on the potential for AFFF to have been stored, used, or released during Navy operations. Four locations (Former Nose Hangar, Building 16, Sanitary WWTP, and Landfill) are recommended for no further action as there is no evidence that AFFF was stored, used, or released at those sites. The recommended path forward and rationale for each site are provided in **Table 5-1**.

Table 5-1. Preliminary Assessment Report Summary and Findings

| Locations | Rationale | Recommendation |
|---|---|---|
| Former Nose Hangar | • Building demolished prior to the formal issue of Military Specification for AFFF (MIL-F-24385) in late 1969. | No Further Action |
| Vehicle Maintenance – Building 18 | • No documentation of AFFF storage, use, or release during maintenance related activities.<br>• Potential isolated refilling of AFFF fire truck tanks may have occurred at the stormwater drain inlet.<br>• No visual signs of a release.<br>• Two fire trucks with AFFF storage tanks were parked at the building during the VSI.<br>• Current and historical fire truck cleaning was performed at the storm drain inlet location.<br>• The stormwater drainage inlet leads to an outfall in Oak Harbor<br>• Groundwater is not potable unless treated.<br>• Ecological exposure in surface water could occur. | Initiate Site Inspection |
| Fire Station – Building 16 | • Constructed in the early 1940s.<br>• At least one fire truck containing AFFF is stationed at Building 16. The AFFF capacity of the fire truck varies as a specific truck is not permanently assigned to the fire station.<br>• No documentation or anecdotal evidence of other AFFF storage, use, or release.<br>• No wash racks or stormwater inlets were identified during the VSI at the fire station.<br>• Current and historical fire truck cleaning was performed at the adjacent vehicle maintenance building storm drain inlet (“wash rack”) (Building 18). | No Further Action |
| Sanitary WWTP | • No documentation of AFFF storage, use, or disposal<br>• No anecdotal evidence of AFFF disposal in the Seaplane Base WWTP system. Based on the information provided by Mr. Hardy during the site interview, follow-up email communications were conducted to confirm possible spraying and disposal of AFFF at Seaplane Base WWTP lagoons. Mr. Hardy confirmed AFFF disposal occurred only in Ault Field, and not Seaplane Base.<br>• Groundwater is not potable unless treated. | No Further Action |
| Seaplane Base Landfill | • Closed prior to the formal issue of Military Specification for AFFF (MIL-F-24385) in late 1969. | No Further Action |
| Biosolids Land Application Area | • No formal records of AFFF storage, use, or release were identified during document review. | Initiate Site Inspection |

Table 5-1. Preliminary Assessment Report Summary and Findings

| Locations | Rationale | Recommendation |
|---|---|---|
| | • In 2014, an AFFF release of approximately 500 gallons (1/8 gallon AFFF and 500 gallons of water) occurred at Ault Field and potentially entered the Ault Field WWTP. Biosolids from the Ault Field WWTP were land applied at multiple locations within NAS Whidbey Island including east of the munitions storage area at Seaplane Base.<br>• Groundwater is not potable unless treated.<br>• Ecological exposure in surface water could occur.<br>• Worker exposure to dust could occur. | |

SECTION 6

# References


Department of the Navy (Navy). 1988. Current Situation Report, Naval Air Station Whidbey Island, Washington. U.S. Navy, Pacific Northwest Branch Office, Western Division, Naval Facilities Engineering Command, Silverdale, WA.

Navy. 2016a. *Environmental Impact Statement for EA-18G "Growler" Airfield Operations at Naval Air Station Whidbey Island Complex, Volume 1.* November.

Navy. 2016b. *Third 5-Year Review for NAS Whidbey Island Ault Field & Seaplane Base. NAS Whidbey Island, Oak Harbor, Washington.* September.

Navy. 2017. *Interim Per- and Polyfluoroalkyl Substances (PFAS) Site Guidance for NAVFAC Remedial Project Managers (RPMs)/September 2017 Update.* September 28.

Shannon and Wilson. 1978. *Geotechnical Report, Sanitary Sewer Rehabilitation Naval Air Station Whidbey Island, Washington.*

URS Consultants, Inc. 1993. *Remedial Investigation for Operable Unit 4 Naval Air Station Whidbey Island*. Volume 1. June.

United States Environmental Protection Agency (USEPA). 1989. *Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual (Part A).* Interim Final. USEPA/540/1-89/002. Office of Emergency and Remedial Response. December.

USEPA. 1991. *Guidance for Performing Preliminary Assessments Under CERCLA*. Office of Emergency and Remedial Response. September.

USEPA. 2017. Regional Screening Levels (RSLs) - Generic Tables (November 2017). https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables-november-2017

United States Geological Survey (USGS). 1982. *Preliminary survey of ground-water resources for Island County, Washington.* [map] https://ngmdb.usgs.gov/Prodesc/proddesc_13763.htm. Open-File Report OF-82-561.

USGS. 1985. *Occurrence of ground water and potential for seawater intrusion, Island County, Washington* [map]. https://ngmdb.usgs.gov/Prodesc/proddesc_36228.htm. Water-Resources Investigations Report 85-4046.

USGS. 1986. *Map Showing Unconsolidated Deposits Grouped on the Basis of Texture, Port Townsend 30'x60' Quadrangle, Puget Sound Region, Washington.* https://pubs.er.usgs.gov/publication/i1198D. Map I-1198-D.

USGS. 1988a. *Bedrock Geologic Map of the Port Townsend 30'x60' Quadrangle, Puget Sound Region, Washington.* https://pubs.er.usgs.gov/publication/i1198G. Map I-1198-G.

USGS. 1988b. *Ground-water resources and simulation of flow in aquifers containing freshwater and seawater, Island County, Washington* [map]. https://ngmdb.usgs.gov/Prodesc/proddesc_46839.htm. Water-Resources Investigations Report 87-4182.

USGS. 2005. *Geologic map of the Oak Harbor, Crescent Harbor, and part of the Smith Island 7.5-minute quadrangles, Island County, Washington.* [map] https://ngmdb.usgs.gov/Prodesc/proddesc_78698.htm.

Washington Department of Ecology (WDOE). 2017. *Well Reports.* https://fortress.wa.gov/ecy/waterresources/map/WCLSWebMap/WellConstructionMapSearch.aspx

# Figures

R:\ENBG\00_Proj\N\Navy\CLEAN\MULTI_REGION\PFC_679580\MapFiles\NW\Whidbey_NAS\CTO4041\SeaplaneBase\PreliminaryFigures\Figure_1-1_Seaplane_Base_Reference_Map_Rev1.mxd3/23/2018SSAVAGE1


**Legend**
- City
- State Route
- Local Road
- Base Boundary

N

0 0.75 1.5 3 Miles

1 inch = 1.5 miles

Figure 1-1
Seaplane Base Reference Map
Naval Air Station Whidbey Island
Oak Harbor, Washington

\\brookside\GIS_SHARE\ENBG\00_Proj\N\Navy\CLEAN\MULTI_REGION\PFC_679580\MapFiles\NW\Whidbey_NAS\CTO4041\SeaplaneBase\PreliminaryFigures\11x17\December\Figure_1-2_Seaplane_Base_Overview_Map.mxd12/14/2017AR055181


**Legend**
- Housing
- Building
- Potential PFAS Release Area
- Base Boundary

N

0 1,000 2,000 4,000 Feet

1 inch = 2,000 feet

Figure 1-2
Seaplane Base Overview Map
Naval Air Station Whidbey Island
Oak Harbor, Washington

FOR OFFICIAL USE ONLY - DO NOT DISTRIBUTE

R:\ENBG\00_Proj\N\Navy\CLEAN\MULTI_REGION\PFC_679580\MapFiles\NW\Whidbey_NAS\CTO4041\SeaplaneBase\PreliminaryFigures\Figure_4-1_FormerNoseHangar_BLDG16_18_PotentialPFAS_Rev1.mxd3/23/2018SSAVAGE1


**Legend**

- Groundwater Flow Direction (dashed where inferred)
- Housing
- Building
- Potential PFAS Release Area
- Base Boundary

N

0 60 120 240 Feet

1 inch = 120 feet

Figure 4-1
Former Nose Hangar, Building 16, and Building 18
Potential PFAS Release Areas
Naval Air Station Whidbey Island
Oak Harbor, Washington

FOR OFFICIAL USE ONLY - DO NOT DISTRIBUTE

R:\ENBG\00_Proj\N\Navy\CLEAN\MULTI_REGION\PFC_679580\MapFiles\NW\Whidbey_NAS\CTO4041\SeaplaneBase\PreliminaryFigures\Figure_4-2_SWWTP_Landfill_PotentialPFAS_Rev1.mxd3/23/2018SSAVAGE1


**Legend**
- Groundwater Flow Direction (dashed where inferred)
- Housing
- Building
- Potential PFAS Release Area
- Base Boundary

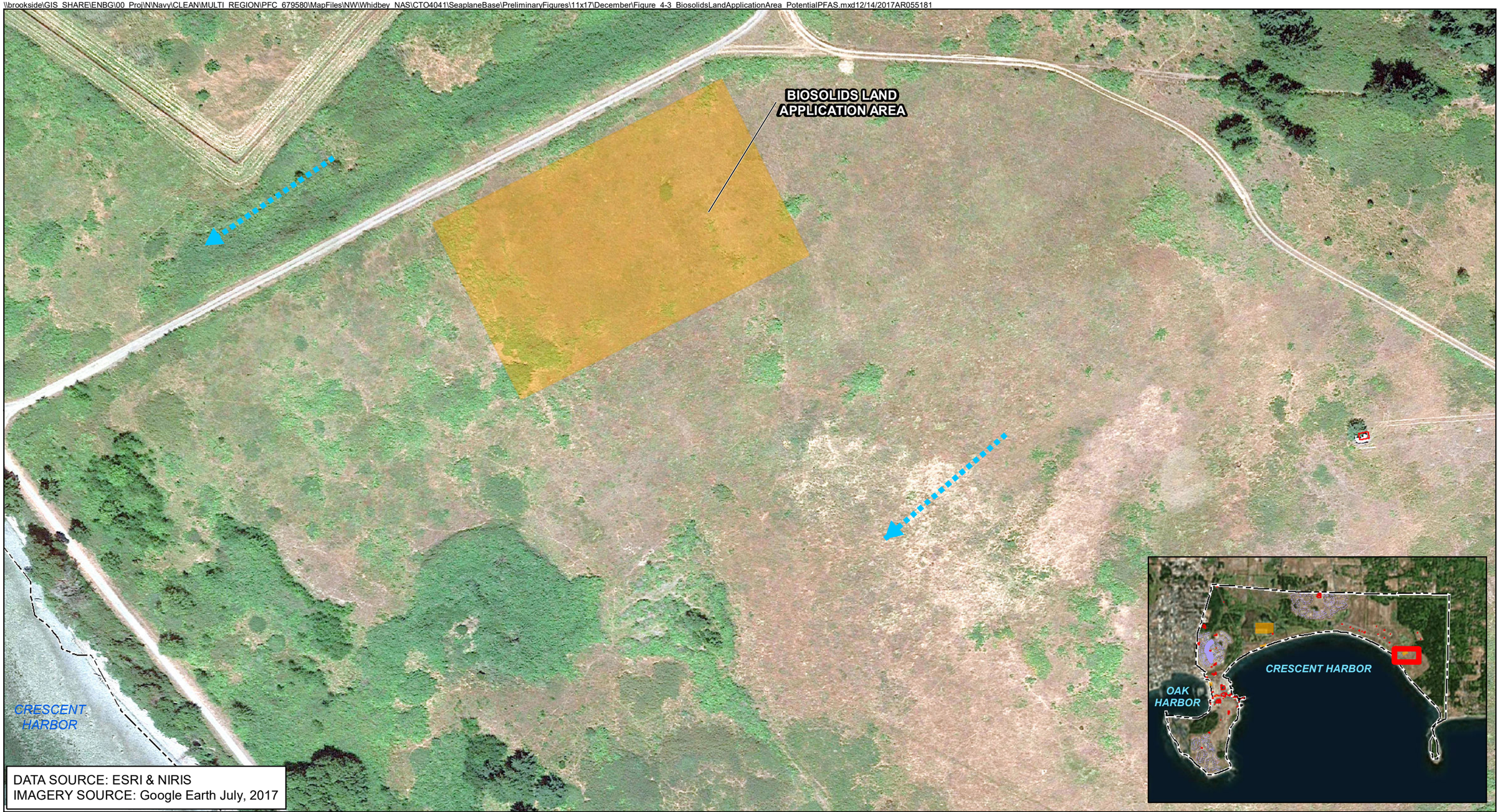
N

0 200 400 800 Feet

1 inch = 400 feet

Figure 4-2
Sanitary WWTP and Seaplane Base Landfill
Potential PFAS Release Areas
Naval Air Station Whidbey Island
Oak Harbor, Washington

\\brookside\GIS_SHARE\ENBG\00_Proj\N\Navy\CLEAN\MULTI_REGION\PFC_679580\MapFiles\NW\Whidbey_NAS\CTO4041\SeaplaneBase\PreliminaryFigures\11x17\December\Figure_4-3_BiosolidsLandApplicationArea_PotentialPFAS.mxd12/14/2017AR055181




DATA SOURCE: ESRI & NIRIS
IMAGERY SOURCE: Google Earth July, 2017

**Legend**
- Groundwater Flow Direction (dashed where inferred)
- Housing
- Building
- Potential PFAS Release Area
- Base Boundary

N

0 60 120 240 Feet

1 inch = 120 feet

Figure 4-3
Biosolids land Application Area
Potential PFAS Release Area
Naval Air Station Whidbey Island
Oak Harbor, Washington

FOR OFFICIAL USE ONLY - DO NOT DISTRIBUTE

# Appendix A
# Summary of Records Reviewed

# Documents Reviewed from the Administrative Record

Department of Navy (Navy). Undated. *Fact Sheet – Naval Air Station Whidbey, Record of Decision for Operable Unit 4, Seaplane Base.*

Navy. 1982. *Firefighting School Oil/Water Separator. NAS Whidbey Island.* June.

Navy. 2016. *Third 5-Year Review for NAS Whidbey Island Ault Field & Seaplane Base. NAS Whidbey Island, Oak Harbor, Washington.* September.

Foster Wheeler Environmental Corporation. 2000. *Independent Remedial Action Closure Report for Remediation of Contaminated Soils at Building 357, Seaplane Base, NAS Whidbey Island, Whidbey Island, Washington.* June.

Science Applications International Corporation. 1990. *Action Plan for the Remedial Investigation/Feasibility Study at Naval Air Station Whidbey Island, Oak Harbor, Washington.* October.

Science Applications International Corporation and URS Consultants, Inc. 1991. *Work Plan for the Remedial Investigation/Feasibility Study Operable Unit 4 Naval Air Station Whidbey Island Seaplane Base, Oak Harbor, Washington.* July.

Stearns, Conrad and Schmidt (SCS) Engineers. 1984. *Navy Assessment and Control of Installation Pollutants. Initial Assessment Study of Naval Air Station, Whidbey Island, Washington.* September.

SCS Engineers. 1988. *Current Situation Report. Naval Air Station, Whidbey Island, Washington.* January.

SCS Engineers. Various Dates. *Confirmation Study Ranking System Worksheets. Naval Air Station, Whidbey Island, Washington.*

The Environmental Company, Inc. 1999. *Environmental Services Monitoring, Long Term Monitoring, Monitoring Well Closure Plan, Naval Air Station Whidbey Island, Washington.* December.

URS Consultants, Inc. 1992. *Health and Safety Plan for a Remedial Investigation/Feasibility Study at Naval Air Station Whidbey Island, Oak Harbor, Washington.* January.

URS Consultants, Inc. 1993. *Remedial Investigation for Operable Unit 4 Naval Air Station Whidbey Island.* Volume 1. June.

Washington Department of Ecology (WDOE). 1992a. *Review of the Hazardous Waste Evaluation Study Draft Report, Naval Air Station Whidbey Island, Oak Harbor, Washington.* April.

WDOE. 1992b. *Review of the Hazardous Waste Evaluation Study Draft Report, Naval Air Station Whidbey Island, Oak Harbor, Washington.* May.

## Interviews

Brooks, John, Retired Director of Research, Principal Investigator for International Arrow, and Goal Technologies. 2017. Personal communication (meeting). November 2.

Crain, Allison, Regional Hazardous Waste Program Manager. 2017. Personal communication (meeting). November 2.

Goodchild, Dave, NAVFAC Northwest UEM Civil Engineer – Seaplane Base Wastewater Treatment Plant. 2017. Personal communication (email). November 15.

Hardy, Blaine, NAVFAC Northwest Public Works, Hazardous Waste Manager. 2017. Personal communication (meeting and email). November 2; December 6.

Hornsby, John, NAS Whidbey Island Crash Captain, 1985 to 2001. Personal communication (meeting). November 8.

Merrill, Sean, NAS Whidbey Island Fire Chief, 2008 to present. 2017. Personal communication (meeting). October 17.

Potter, Lloyd, Public Works (FEAD, Lead Engineering Tech) NAS Whidbey Island from 1984 to 1987, and 1993 to present. 2017. Personal communication (meeting). November 2.

Prince, Tom, NAS Whidbey AEMT/Firefighter. 2017. Personal communication (meeting). November 8.

Waeschle, Kurt, Regional Fire Chief, Navy Region NW 2008 to present; NAS Whidbey Island Fire Chief 1999-2006. 2017. Personal Communication (meeting and email). October 17; December 4; and December 8.

Willey, Allan, CDR, USN, NAVFAC Northwest Public Works Commander. 2017. Personal communication (meeting). November 2.

# Appendix B
# Interview Notes

| Communication Record[1] | |
|---|---|
| Date 10-17-17 | Time 1210-1400 |
| | |
| Name of Base, State: Keyport, WA – regarding Ault Field/OLF Coupeville /Seaplane Base | |
| Interviewer: J. Horton, J. Hauser | |
| Organization: CH2M HILL | Phone: (360) 556-0621 |
| Position/role on this project: Task Managers | Email: Janice.horton@ch2m.com |
| | |
| Interviewee: Kurt Waeschle (Sean Merrill via phone) | |
| Organization: Navy Regional NW Fire and Emergency Services | Phone: (360) 340-1342 |
| Position/Job Title: Fire Chief | Email: kurt.waeschle@navy.mil |
| How long in this position? 2008 to present | |
| How long in current and previous positions? Naval Air Station Whidbey Island (NASWI) Fire Chief 1999 to 2006 | |
| Have you held similar positions at other Bases? N/A | |
| Which Base? N/A | |
| How long? N/A | |
| | |
| General Discussion Notes and Information: | |
| Assumed responsibility for fire and emergency at Outlying Landing Field (OLF) Coupeville in March/April 2012. NASWI AirOps had responsibility for OLF Coupeville prior to March 2012. | |
| Two documented events exist for OLF Coupeville – neither utilized foam, and both are recorded in the Navy Installation Restoration Information System (NIRIS). | |
| One event was a hard landing for a helicopter; the other was a light civil event that occurred within the last 2 years. There is no information prior to October 1, 2012. | |
| See Bill MacMillan[2] from NASWI AirOps for further information. | |
| Mr. Waeschle provided a list of names of key firefighting personnel to legal department dating back to 1972. | |

[1] This interview record contains information relevant to Ault Field, Seaplane Base, and OLF Coupeville. Information not directly relevant to Sea Plane Base has been shaded in gray.

[2] Bill MacMillan was contacted via email on 10/30/2017. In a response sent on 10/31/2017 he said that he had "no knowledge of storage or use of AFFF at NASWI."

| |
|---|
| A barn fire is reported to have occurred at OLF Coupeville some years ago. The Navy responded with “buckets of chemical,” according to statements from onlookers. Navy personnel involved were “contacted” and stated that no aqueous film forming foam (AFFF) was used. |
| * Mr. Waeschle stated that emails are part of the litigation hold. All emails sent to Mr. Waeschle from this team will be included in the litigation hold. |
| In the 1970s, protein foam containing Ox blood was used. NASWI Hangar 7 used protein foam until a couple of years ago. |
| At Ault Field, all foam storage and crash truck reservicing was done at Building 121 before it was demolished and turned into a parking lot. The new fire station is known as Building 2687. During the normal AFFF truck-filling procedure, the foam would bubble over the top of the truck and may have dripped onto the ground. Five-gallon buckets of foam were poured into the truck, then hoses were used to fill the remainder of the truck with water. After filling the trucks, the garden hoses were usually put in 5-gallon buckets that people would “take home.” This was done from 1999 to 2006. This filling method has not been practiced since 2008. The new filling procedure is not prone to leaks or releases, as the hose fills the tank from the bottom via piping, rather than pouring from the top. |
| For filling, each truck has approximately 130 gallons of foam. At times, trucks would lose foam on the fire station floor from leaking tanks. Crash response trucks also leaked foam when parked near Area 31 at the Hardstand parking. Trucks were parked for approximately 4-hour intervals. |
| Naval Air Systems Command (NAVAIR) 80-R-14 has a specification direction for AFFF. |
| Refractory testing to check the viscosity of foam was not conducted as part of normal procedure. It was conducted once in 1999 on the taxiway at the airfield drains. |
| Operational testing at the NASWI waste treatment plant may have been done but not when Mr. Merrill was on duty. It was proposed to NAVFAC Northwest Environmental, but to either Fire Chief’s knowledge, it wasn’t actually performed. |
| JP-8 jet fuel was burned at the NASWI fire school (500 gallon-per-minute [gpm] nozzles). The agent selector knob on the fire truck was operated as right applied more water, left applied more foam; one to two times per year someone would pull it too far left and release foam into the pit, which required reservicing of the truck. Overfoaming created water/foam separator issues from too much foam in the pit (at current fire training school). This has been at the same location during Mr. Waeschle’s time. He suggests looking at that pit as there may be JP-8 issues there in addition to foam-related issues. Eventually the JP-8 tanks were replaced with propane tanks. |
| In Mr. Waeschle’s career, he has never directed the use of foam due to any event at NASWI or elsewhere. During 2006-2007, foam was used on an F-18 crash (note, Mr. Waeschle and Mr. Merrill were not Fire Chiefs during this time). Mr. Waeschle stated that the biggest instance of foam deployment that he has observed, is due to training and accidental releases. Most training and actual firefighting is done using water, due to the low flash point of JP-8. Firefighters are trained to know that foam is only to be used in actual emergencies. |

| |
|---|
| Currently, all foam is stored at NASWI Building 2687 (at Ault Field). |
| Firefighters would train for crashes, but rarely would use foam. On structure fires, it was generally not used, and the higher likelihood of use was on car fires. |
| Mr. Waeschle has previously provided an inventory of all foam to NAVFAC Northwest Environmental. Currently, he has two trucks that have foam that failed third-party refractory testing (adopted in 2008). He is unsure of the chemical composition of the foam in each truck, his primary concern is viscosity. |
| At NASWI, trucks have also been washed at the P3 washrack. Foam was rinsed into the grass when the trucks were being washed there. |
| At OLF Coupeville, from an operational perspective, there was no reason for trucks to deploy foam at Building 2807. In 2009, there was an agreement with AirOps where the NASWI Fire Department was to provide OLF Coupeville personal protective equipment and apparatus (fire trucks), but AirOps would provide staffing. |
| During 2004-2005, the Navy responded to a smoking dump truck at the waste transfer facility approximately ½ mile away from OLF Coupeville. (The transfer facility was owned by OLF Coupeville.) Foam may or may not have been used at that event. |
| For major fuel spills, foam was not deployed because JP-8 generally doesn't burn due to the weather conditions here. The preferred spill response method was to dike, divert, and dam. Mr. Waeschle recommends looking at the Area 16 drainage system available on NIRIS. |
| Other than at hangars, no known large-scale AFFF was deployed by the Fire Department during Mr. Waeschle's time. |
| At Seaplane Base, foam loading occurred at Building 19 and at the washrack. Truck washing also occurred at the washrack (recalling that foam during reservicing or leaking tank trucks would have AFFF residue on the outer portion of the truck). Additionally, Building 12 behind the fire station may have had foam used. |
| At OLF Coupeville, truck washing occurs just outside the fire station. |
| Mr. Waeschle has no knowledge of high-expansion foam being used at NASWI. |
| Mr. Waeschle also suggested speaking to the assistant fire chiefs for more information.[3] |

[3] Contact information was obtained for Scott Style (assistant fire chief in 2007). Attempts made to contact Mr. Style were unsuccessful (he was out of the country at the time).

| Communication Record[1] | |
|---|---|
| Date: 11-02-2017 | Time: 1430 |
| | |
| Name of Base, State: Naval Air Station Whidbey Island (NASWI) | |
| Interviewer: Janice Horton, Eric Cutler | |
| Organization: CH2M HILL | Phone: (360) 556-0621 |
| Position/role on this project: Task Manager | Email: Janice.Horton@CH2M.com |
| | |
| Interviewee: John Brooks | |
| Organization: Retired Navy and Former Lab Research Manager in charge of AFFF specification, verification, and fire research/testing. | Phone: (360) 941-2358 |
| Position/Job Title: N/A | Email: JBrooks@PYROGEN.COM |
| How long in this position? N/A | |
| How long in current and previous positions? Stationed at NASWI late 1960s to late 1970s. | |
| Have you held similar positions at other Bases? Yes | |
| Which Base? NASWI and Former Naval Air Facility Adak during active duty | |
| How long? N/A | |
| | |
| General Discussion Notes and Information: Charles (Charlie) Escola, NAVFAC NW Naval Technical Representative (NTR) was also in attendance during the interview. | |
| Mr. Brooks stated that perfluorooctane sulfonate (PFOS) was first invented in 1968 and its manufacture was discontinued around 2000 (including as a component in aqueous film forming foam [AFFF]). In the spring of 2000, 3M (the only PFOS manufacturer at the time) ceased production of PFOS-based AFFF due to a toxicity issue. Up until 2001, AFFF was said to only have 5-year shelf life. In 2002, perfluorooctanoic acid (PFOA)-based AFFF was produced and all PFOS production had ended. | |
| Mr. Brooks stated that from the late 1960s, when he was stationed at NASWI, during fire training activities at Area 31, only the last half of Friday was designated for foam usage during training. The first day of fire training was in-class and the second through fourth days were live fire training at Area 31 where only water was used to extinguish the 500 gallons of JP-5 jet fuel lit on fire on the 50-foot by 50-foot concrete burn pad. There was approximately ¼ inch of water on top of the jet fuel-covered concrete when only water was used. On the last day of training, typically the fifth day, AFFF would be sprayed to put out the fire. | |

[1] This interview record contains information relevant to Ault Field, Seaplane Base, and OLF Coupeville. Information not directly relevant to Seaplane Base has been shaded in gray.

| |
|---|
| AFFF was only used on the last day because AFFF coated the burn pad and would prevent fires from being able to be started for subsequent training days. When water was used to extinguish the fire, it took several minutes to put the fire out. When the AFFF was used, it took about 30 seconds to extinguish the fire. Mr. Brooks recalled the Area 31 burn pad drained to a tank and there may have been some minor spillage from the pad to ground surfaces. After the Area 31 fire training area was shut down, fire training activities were moved to the state facility in Enumclaw where training occurred for a couple of years before being moved back to the current fire training area. Mr. Brooks recalled the current fire training area used propane and water to start and extinguish fires. He is not aware of any AFFF used at the current fire training area during his time stationed at NASWI. |
| Mr. Brooks recalled that municipalities likely did not use AFFF foam until the mid-1970s due to the price. He stated that AFFF also would likely not be used on non-petroleum based fires (Class A fires) such as building fires and wildfires because it is not as effective as water. |
| Mr. Brooks recalled an agricultural lease program up until 8 to 10 years ago, specifically at OLF Coupeville, and a local farmer cutting hay from the fields within the OLF property boundary. Mr. Brooks recalled that during his research days he was aware of the use of PFOS as a surfactant in agricultural use (herbicides, insecticides, etc.). He also stated the Naval Research Laboratory (NRL) did a worldwide inventory of AFFF in the 2000 to 2001 timeframe and quarterly, and annual reports of that data may be available. |
| Mr. Brooks stated that PFOA releases likely occurred from refueling activities at the former fire station and parking area near Area 31. |
| Mr. Brooks recalled a golf course crash in approximately 1972, and an A-6 runway crash in the late 1980s. Mr. Brooks stated Chief Hadder was Ault Field Fire Chief in 1979 while Mr. Brooks was stationed in Adak, Alaska, and may have more information on crashes. |
| At OLF Coupeville, Mr. Brooks recalled a crash west of the OLF Coupeville flight lines in 1982 and suspects AFFF was used. |

| Communication Record[1] | |
|---|---|
| Date: 11-08-2017 | Time: 1200 |
| | |
| Name of Base, State: Naval Air Station Whidbey Island (NASWI) | |
| Interviewer: Janice Horton, Eric Cutler | |
| Organization: CH2M HILL | Phone: (360) 556-0621 |
| Position/role on this project: Task Manager | Email: Janice.Horton@CH2M.com |
| | |
| Interviewee: John Hornsby | |
| Organization: Retired | Phone: (360) 675-6139 |
| Position/Job Title: Former Crash Captain (1985 to 2001) | Email: jnahornsby@comcast.net |
| How long in this position? Retired in 2001 | |
| How long in current and previous positions? | |
| Have you held similar positions at other Bases? | |
| Which Base? | |
| How long? | |
| | |
| General Discussion Notes and Information: Also in attendance Charles (Charlie) Escola, NAVFAC NW Naval Technical Representative (NTR). | |
| Mr. Hornsby volunteers at the Oak Harbor Fire Department. | |
| Mr. Hornsby came to NASWI in 1977 from Kingsville, Texas. He was promoted to Crash Captain in 1985 and remained in that position until retiring in 2001. The role of the Crash Captain was to take control of all flight operations when a pilot called in for an incident (crash landing). Mr. Hornsby would station three crash trucks along the length of the runway, one at the approach, one at the roll out, and one mid-field. | |
| Mr. Hornsby recalled that the P3A crash occurred farther north at Runway 13-31 than what was presented on the figure (location #15 on **Figure 1**). | |
| Mr. Hornsby stated the Fire Department logbooks could be a source for crash information, which may include Aircraft Incident Reports. Mr. Hornsby said Allen Sprouse[2], the Fire Inspector at the Fire Station, has access to the logbooks. Those records could be available from Aviation Safety or AirOps, and may include the volume of aqueous film forming foam (AFFF) used when the crashes occurred. | |

[1] This interview record contains information relevant to Ault Field, Seaplane Base, and OLF Coupeville. Information not directly relevant to Seaplane Base has been shaded in gray.

[2] Attempts to identify contact information for Allen Sprouse were unsuccessful.

| |
|---|
| Mr. Hornsby recalled an EA-6B crash to the east part of runway 07-25 in the mid-1990s. A gear stuck and caused a wheel fire. The crash truck used AFFF to put out the fire. Mr. Hornsby stated this was the only incident he could recall where AFFF was used. *Note: Mr. Hornsby circled the approximate location of this incident on the map and the location will be included on applicable figures.* |
| Mr. Hornsby recalled an A6 crash occurring sometime after 1990. The crash was caused by a pin being put in backward in the tail section. This crash occurred at the east end of the 07-25 runway. |
| Mr. Hornsby stated the Fire Chief would fill out the reports for crashes. Joe Hader[3] was the Fire Chief from the mid-1970s until his retirement prior to Mr. Hornsby's retirement. Mr. Hornsby does not recall Fire Chief Kurt Waeschle. |
| Mr. Hornsby recalled a fire set by an employee in the Chapel Building, but to his knowledge AFFF was not used to extinguish the fire. |
| Mr. Hornsby stated that pre-foaming of the runway was performed with protein foam, but this procedure ceased in the mid-1990s because it was determined to be ineffective. Pilots declined foaming the runways, so to Mr. Hornsby's knowledge no AFFF was used to pre-foam the runways. |
| Mr. Hornsby stated that in Hangar 7, protein foam in the system was replaced by AFFF. The only known use of AFFF during his time was when the sprinkler system was accepted and the AFFF was deluged. |
| Mr. Hornsby recalled that the hangar fire suppression systems were tested when they were newly installed or when work was performed on them, including AFFF systems. Drip pans were positioned under discharge sprinklers to capture discharged AFFF, and the percentage of foam was measured. |
| Mr. Hornsby stated that any planes with AFFF, crash parts, and other potentially contaminated materials were taken to the wash rack between Hangars 7 and 9. The wash rack was installed in the mid-1980s. Mr. Hornsby recalled that the wash rack was installed prior to the eruption of Mt. St. Helens. He recalled the timeline because newly purchased trucks were traveling to Ault Field from eastern Washington and were covered in ash, so when they arrived at Ault Field they went through the wash rack. At the wash rack there is an oil-water separator and "once the valve was thrown to get AFFF out of the o/w separator, the pump needed to be cleaned out as well." Mr. Hornsby said the cleaning records could be obtained from the Base Operating Support Contract (BOSC). |
| Mr. Hornsby recalled there was/is a stormwater weir at the eastern extent of the runway drainage ditches. |
| Mr. Hornsby stated that it is common practice to put out hay fires with AFFF foam since the foam is effective at penetrating hay bales, but to his knowledge nothing like this occurred at Ault Field. |

[3] Attempts to contact Joe Hader were unsuccessful. The information gathered suggested that Mr. Hader was deceased at the time of the Preliminary Assessment information search.

| |
|---|
| Mr. Hornsby stated that at the hardstand area near Area 31, the trucks did not leak foam "frequently." He did recall that in the 1970s 5-gallon buckets of AFFF were kept on top of the MB-5 crash trucks because those trucks did not have an AFFF tank. Mr. Hornsby stated OLF Coupeville had one or two of those trucks during his timeframe. |
| Mr. Hornsby recalled that during his time as Crash Captain, his crew performed 32 in a 9-hour period, which is the record for arrestments. When each arrestment was made, the cable would have to be respooled around the drums by hand. The new arrestment system uses hydraulics to brake and control the planes. |
| Mr. Hornsby recalled at Seaplane Base there was a fuel transfer tank overflow. He does not recall whether a fire occurred, nor the timeframe for that tank overflow. |
| Mr. Hornsby stated that Oak Harbor Fire Department (Dist. 2) has used AFFF. Contact names provided are: Mike Bugston (Battalion Chief), Ray Merrill, and Craig Anderson (Training Officer).[4] |

[4] The named Oak Harbor Fire Department personnel were not contacted, as this was outside of the scope of this Preliminary Assessment.


**Figure 1**
*Ault Field*

| Communication Record[1] | |
|---|---|
| Date: 11-02-2017 | Time: 1300 |
| | |
| Name of Base, State: Naval Air Station Whidbey Island (NASWI) | |
| Interviewer: Janice Horton, Eric Cutler | |
| Organization: CH2M HILL | Phone: (360) 556-0621 |
| Position/role on this project: Task Manager | Email: Janice.Horton@CH2M.com |
| | |
| Interviewees: Blaine Hardy (Public Works, Environmental, Hazardous Waste Manager), Allison Crain (NAVFAC NW), Officer Allen Willey (Public Works Officer), Lloyd Potter (FEAD, Lead Engineering Tech) | |
| Organization: NAVFAC, Public Works | Phone: |
| Position/Job Title: | Email: |
| How long in this position? | |
| How long in current and previous positions? | |
| Have you held similar positions at other Bases? | |
| Which Base? | |
| How long? | |
| | |
| General Discussion Notes and Information: The format of the interview was an open discussion on what the group recalls from storage/use/disposal of AFFF. Charles (Charlie) Escola, NAVFAC NW Naval Technical Representative was also in attendance during the interview. | |
| Mrs. Crain was Environmental Manager/Hazardous Waste Manager from 2011 to 2015, preceding Mr. Hardy.<br>Mr. Potter was stationed at NASWI from 1984 to 1987, and has been at NASWI since 1993. | |
| Mr. Hardy stated the transition to AFFF from protein foam was not instantaneous. After 1970, protein foam was used up before AFFF was put into circulation. The date when protein foam ceased being used is unknown. | |
| Mr. Potter stated the crash response to the 1986 EA-6B crash was large and AFFF was likely used. | |
| Hangar 7 AFFF Release – AFFF was released during an accidental triggering of the Hangar 7 fire suppression system in Sept 2016. The AFFF/water was captured in the Hangar 7 | |

[1] This interview record contains information relevant to Ault Field, Seaplane Base, and OLF Coupeville. Information not directly relevant to Seaplane Base has been shaded in gray.

| |
|---|
| containment (concrete) tank. The AFFF/water was transferred to Building 420 via pump truck, as approved by Officer Willey. The transfer trucks were triple-rinsed, with all AFFF/water and rinsate going into the concrete tank at Building 420. Within a couple of days of the Hangar 7 tank being emptied, it was observed to be full of water again. Upon further investigation, it was determined the tank was cracked and had filled back up with water surcharged around the tank. The tank was sealed within the last 3 to 6 months, and presently there is approximately 3 to 6 inches of water in the tank. The tank is configured with a 10-inch-diameter inlet on the wall, and is buried approximately 4 to 5 feet below ground surface. Mr. Potter recalled that during construction, coffer dams were built around the tank to keep water out of the excavation because the groundwater in the area was so shallow. The AFFF/water mixture is still in the concrete tanks, and will be stored there until a granular activated carbon (GAC) filtration system is funded. The resultant carbon from the GAC filters is to be incinerated as per a 2016 Navy mandate. |
| Mrs. Crain stated that as of 2016 a Navy mandate requires all AFFF materials to undergo either incineration or solidification. She can provide a copy of that policy. |
| Mrs. Crain stated that, in general, most stormwater drains lead to the oil/water separator north of the hangars, then to the Strait of Juan de Fuca. Officer Willey stated the storm utility GIS data is currently being updated as it does not accurately reflect what ground truthing shows. Mr. Hardy stated that there have been no known direct discharges of storm to sanitary sewer or vice-versa and it is believed that none of the stormwater drains that could have contained AFFF are connected to the sewer system, since AFFF causes issues with the sanitary sewer treatment. Dye tests are tentatively planned for stormwater lines from and in the vicinity of the hangars. |
| Mr. Hardy stated AFFF previously had been disposed of by spray disposal or it was sent to the sanitary sewer. Mr. Hardy said he could provide emails from the former Program Manager with requests to dispose of AFFF by spraying on the wastewater treatment plant (WWTP) lagoons. Sending the AFFF through the sewer system was corrosive to piping. Spray disposal from the fire trucks was metered. It was stated by the interviewees that in the last 10 years, small amounts of AFFF have been sent to the current WWTP as a means of viable disposal. |
| Mr. Hardy stated that AFFF was sprayed on the former WWTP lagoons directly south of the current WWTP during the 2005-2009 timeframe. The lagoons were closed 12 to 14 years ago. Olivia Sumaway (Environmental) conducted the sampling of those lagoons. |
| The interviewees have no knowledge of any official record of AFFF discharges in the hangars other than the confirmed discharge at Hangar 7 within the last year. |
| Mr. Potter stated that sometime between 1984 and 1987, there was a house fire south of the old security buildings where AFFF could potentially have been sprayed. |
| Mrs. Crain confirmed chrome plating was performed at Building 2547. The closure date of the chrome plating building is unknown. |
| Mr. Hardy stated there is a component of per- and polyfluroalkyl substances (PFAS) in Glycol. The 2016 Superfund Amendments and Reauthorization Act (SARA) report includes the Glycol quantity stored at the site. |

| |
|---|
| Mr. Hardy stated that Building 2713 (now Building 2757) is used for waste handling; however, there have been no documented releases of AFFF. Mrs. Crain stated if there were any releases due to spills, a Maximo work request could be obtained from the Base Operating Support Contract (BOSC). The BOSC should have spill reports dating back to the 1980s. Environmental records of spills may not be available prior to Mrs. Crain's time. |
| Mr. Hardy stated that every 45 to 90 days, another container of AFFF is found from various locations across the Base. In May 2017, AFFF drums were found in storage at Hangar 14. |
| Officer Willey stated all hangar fire suppression systems are tested annually as part of the Preventative Maintenance (PM) Program and that these PMs would be included on the Maximo list. In general, testing goes to collection drains. Some collection drains go to stormwater. Officer Willey stated a big culprit could be hangars and storm drain outfalls from hangars. |
| Mr. Hardy stated he did not recall any biosolids being taken to the golf course. To his knowledge, biosolids are now composted and disposed of at Area 6 (adjacent to the wood chipper), and are often given away for construction, campgrounds, or beautification projects on-Base, or are land-applied at Area 6 and at Seaplane Base east of the munitions storage areas. This occurred in 2015 and 2017. |
| Mrs. Crain stated that information on hotpits could be obtained from Karen Campbell (NAVFAC SE). Karen was the CERCLA Tank Manager. Mr. Potter stated there were aboveground storage tanks at the temporary hotpits, which were refueling locations in service for a couple of years. The interviewees stated there are no known spills or application of AFFF at the temporary hotpits. |
| Mr. Potter stated that at one time Ault Field held land leases with farmers. |
| Seaplane Base had primarily industrial operations. There were four fuel farms on Seaplane Base, all of which were shut down during the 1990s. Mr. Potter was part of the shutdown project. Wells were installed with analytical testing done on the wells and tanks. the tanks were decommissioned as part of the shutdown project. |
| Potential interviewees for additional information: |
| Karen Campbell[2] (NAVFAC SE) (317) 491-2929 |
| Rolando Ferris[3] (Environmental, Fleet Readiness Center (FRC) contact for information on the chrome plating facility) (360) 257-8646 |
| Rick Dutton[4] (Supply Manager at Fleet Logistics Center [FLC]) Richard.dutton@navy.mil for information on AFFF managed as waste at Building 2757 |

[2] Karen Campbell was contacted as part of the Preliminary Assessments at NASWI. She stated that she did not have any records relevant to this investigation.

[3] Attempts made to contact Rolando Ferris were unsuccessful.

[4] Rick Dutton was not contacted as part of the Preliminary Assessments at NASWI as the information he may have provided was obtained from Navy environmental personnel.

| |
|---|
| Dave Krause[5] (Public Works, retired), Allison may have his contact information |
| Bobbi Holly[6] (for issues at Fuel Farms) (360) 672-1204<br>Don Hill[7] (for issues at Fuel Farms) currently works in Mr. Potter's department |

[5] Contact information was not obtained for Rick Dutton and no attempts were made to contact him. Multiple other staff from Public Works were interviewed.

[6] Bobbi Holly was not contacted as part of the Preliminary Assessments at NASWI as it was determined that only water was used for fire suppression at the fuel farms.

[7] Don Hill was not contacted as part of the Preliminary Assessments at NASWI as it was determined that only water was used for fire suppression at the fuel farms.

| Communication Record[1] | |
|---|---|
| Date: 11-08-2017 | Time: 1000 |
| | |
| Name of Base, State: Naval Air Station Whidbey Island (NASWI) | |
| Interviewer: Janice Horton, Eric Cutler | |
| Organization: CH2M HILL | Phone: (360) 556-0621 |
| Position/role on this project: Task Manager | Email: Janice.Horton@CH2M.com |
| | |
| Interviewee: Tom Prince | |
| Organization: Navy Fire and Emergency Services | Phone: (360) 257-2532 |
| Position/Job Title: Advanced Emergency Medical Technician (AEMT)/Firefighter | Email: thomas.prince@navy.mil |
| How long in this position? Since December 1997 | |
| How long in current and previous positions? N/A | |
| Have you held similar positions at other Bases? N/A | |
| Which Base? N/A | |
| How long? N/A | |
| | |
| General Discussion Notes and Information: Charles (Charlie) Escola, NAVFAC NW Navy Technical Representative (NTR) was also present during the interview. | |
| When Mr. Prince was stationed at the hardstand area, which was the crash truck parking location during refueling at the hotpits. He did not see any AFFF leaking from the crash truck tanks; however, he stated it was possible leaks could have occurred. The trucks stationed at the hardstand were there for 8 hours in rotation as the hardstand was manned all day during refueling. | |
| Mr. Prince confirmed the locations of the two hotpits, but during his time as a firefighter, he said that, to his knowledge, no foam was used at either location. | |
| Mr. Prince provided a photo of an F-18 plane crash and the approximate location (**Figures 1 and 2**) at the north end of Runway 13-31 at approximately the 2,000-foot marker on 30 April 2006. Mr. Prince was the firefighter who responded, and applied AFFF to three portions of the F-18, over the nose of the F-18, the tail, and on a burning fuel hose. He recalled that each of the three applications of AFFF lasted approximately 3 to 5 seconds. The quantity of AFFF used to put out the fire was unknown, but Mr. Prince recalls that 80 to 90 percent of the water was left in the truck tank. Mr. Prince stated that runoff of AFFF was controlled with | |

[1] This interview record contains information relevant to Ault Field, Seaplane Base, and OLF Coupeville. Information not directly relevant to Seaplane Base has been shaded in gray.

| |
|---|
| dikes and spill containment and runoff of AFFF into ditches was unlikely. He stated the cleanup was performed by NAVFAC Environmental. |
| Mr. Prince stated fires on the runway ramp are put out using halon extinguishers, not AFFF. Wheel-unit halon extinguishers are typically spaced out on runway aprons at designed intervals and would be used prior to the fire truck arrival. Therefore, the fires would have already been extinguished so no AFFF would be used. |
| Mr. Prince stated that foam is not intentionally used at the current Fire Training Area (FTA), but every once in a while, someone may accidentally release foam. If this occurs, the foam shutoff would be immediate. The foam would have to overflow the containment tank in order to escape the closed loop system. The water used to fight training fires at the current FTA comes from the containment tank onsite, and is not used offsite because of the JP-5 jet fuel and propane in the water. The system is an enclosed loop and closed pit system. |
| Mr. Prince is only aware of the current FTA, which has been in use since 1997 when Mr. Prince began. |
| Mr. Prince stated protein foam is used at Hangar 7 and suggested obtaining the BOSC Preventative Maintenance (PM) records for the changeover date. **Note: the 2016 Hangar 7 discharge has been documented as an AFFF release.* |
| Mr. Prince stated AFFF is stored in 55-gallon drums at the current fire station at Ault Field. A pump is used to transfer the AFFF from the drums into the truck. Any spills, even small amounts of AFFF, would be noticed immediately because AFFF leaves a sticky white residue on anything it touches, which is difficult to clean off and eats away at the material it touches. |
| Mr. Prince stated truck leaks could have occurred if personnel were not careful during reservicing at the former fire station, although leaks were unlikely due to the filling box being of sufficient size to accommodate the entire contents of the 5-gallon bucket without spillage. Again, he stated that personnel pouring AFFF into the filling box would be immediately aware of any spills, and that the difficulty of cleaning up AFFF would likely ensure personnel being careful during truck reservicing. |
| Mr. Prince stated that presently there is AFFF stored in the caged area at the current Fire Station at Ault Field. |
| Mr. Prince verified that the current Ault Field Fire Station (Building 2897) is built on the same footprint as the former Fire Station. The demolition and new construction of the Fire Station took 2 to 3 years to complete, and a portion of the former Fire Station concrete slab still exists at the new Fire Station. |
| Mr. Prince stated that all fire training activities for Ault Field, Seaplane Base, and OLF Coupeville have occurred at Ault Field at either the Runway Fire School (Area 31), or the current FTA. |
| Mr. Prince confirmed that the Fire Station and adjacent maintenance facility at Seaplane Base have been in the same locations since World War II. Mr. Prince circled the location of both (**Figure 3**). |
| Mr. Prince stated the only AFFF stored at Seaplane Base is in the fire trucks. |

| |
|---|
| Mr. Prince stated that at OLF Coupeville, the FP Tank 11 (aboveground water tank on top of a well head building) was used to refill the fire trucks with water faster. The process of filling the truck with water this way should not have created any spillage of AFFF because the water filling box on top of the truck is separate from the AFFF filling box. The water and AFFF are in separate tanks on the truck and the water/AFFF mixing does not occur in the tanks, but at a valve on the truck only during foam spraying. |
| Mr. Prince verified the house fire (previously discussed by Mr. Potter during the interview on November 2, 2017) occurred at a residence in the southern part of Ault Field. Mr. Prince verified the fire was put out with water only and recalled it was Ladder 71 that responded. Mr. Prince also stated that typically all house fire training exercises are done with water, and during an actual housefire, firefighters would naturally react as they would from the training, which is to just use water. |
| Mr. Prince said AFFF was not used on car fires during his time at Ault Field. |
| Mr. Prince suggested accessing the NAVFAC Enterprise Safety Applications Management System (ESAMS) for any firefighting records. ESAMS records should show National Fire Incident Reporting System entries. Mr. Escola stated he can request those records for CH2M as he has access to ESAMS.[2] |


**Figure 1**
*Ault Field*

[2] This information was requested several times during this Preliminary Assessment, but was not obtained.


**Figure 2**
*Ault Field*

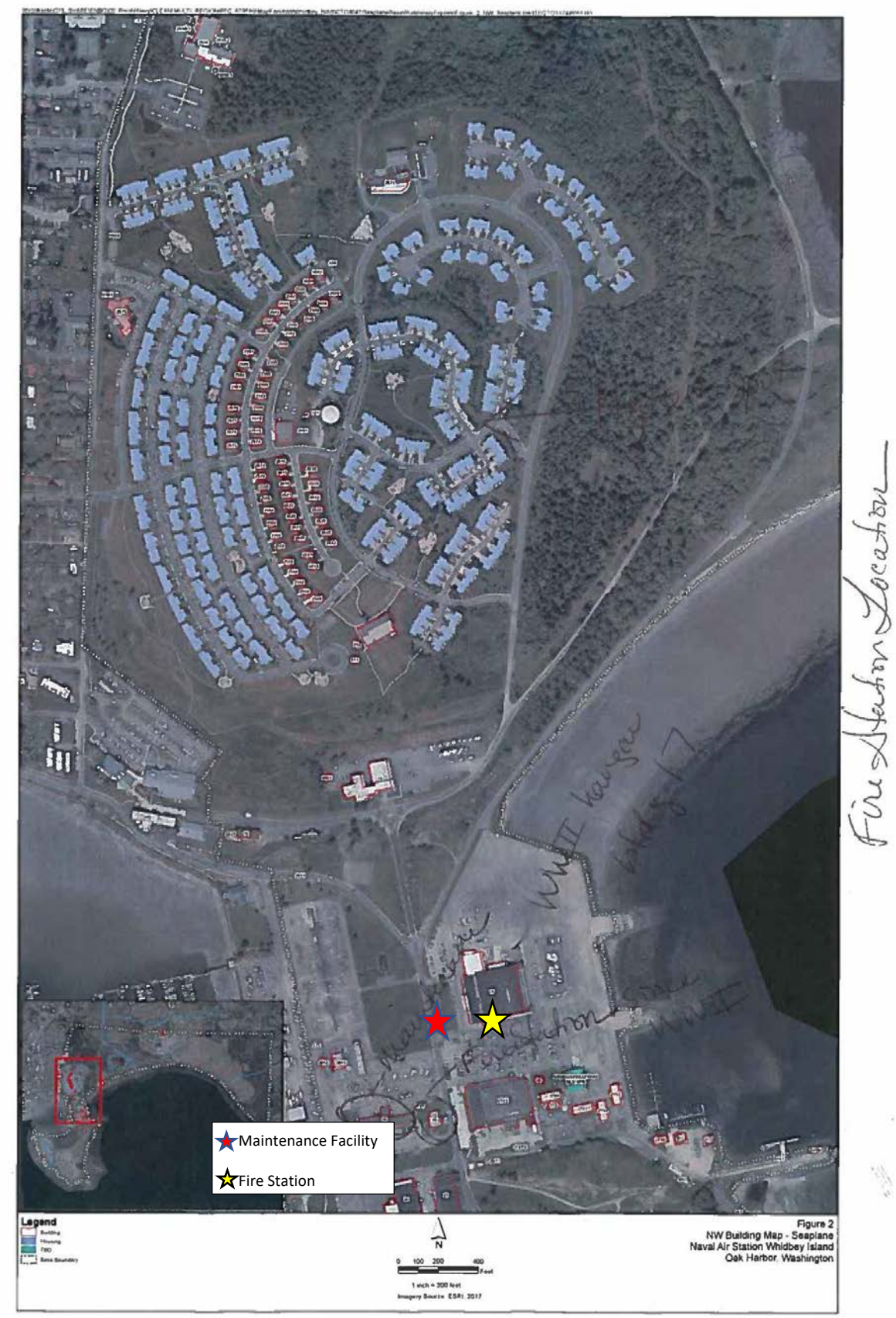



**Figure 3**
*Seaplane Base*

# Appendix C
# Visual Site Inspection Report

# Field Activity Report

Date: 11-15-2017

Name of Base: NAS Whidbey Island (Ault Field, Seaplane Base)

Field Personnel: Eric Cutler

Organization: CH2M Hill | Phone: (650) 823-4947

NAVFAC Escort(s): Charlie Escola, Steve Skeehan

Organization: NAVFAC NW

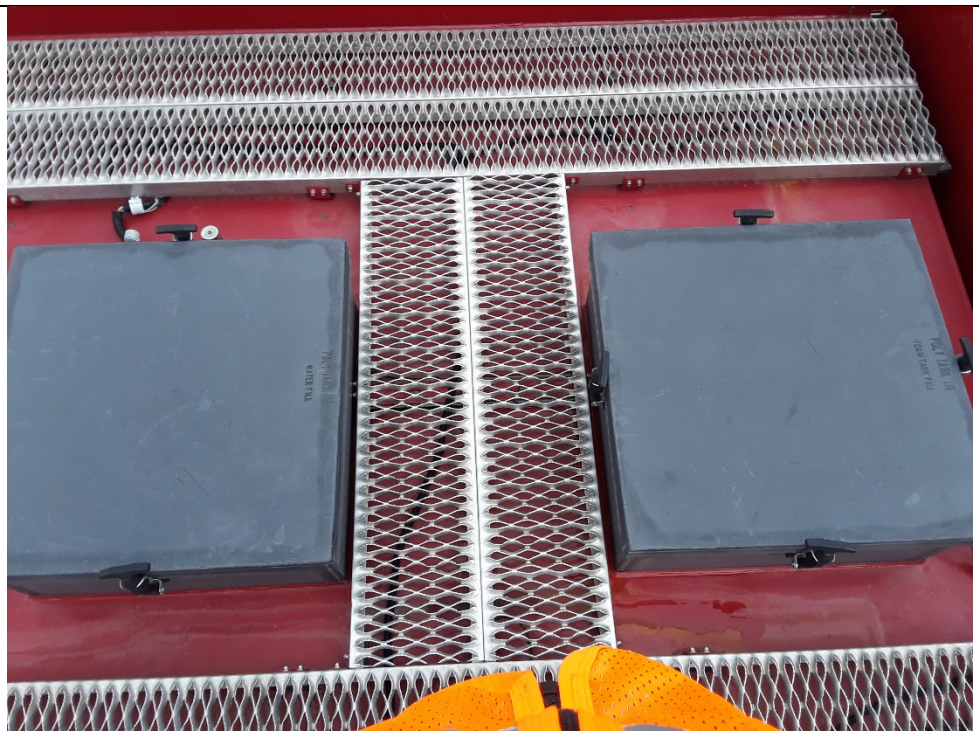
| Time | General Notes/Photo Log: |
|---|---|
| 0910 | -Meet Charlie and Steve at the Island Café in Oak Harbor. |
| 0930 | -Arrive at Seaplane Base |
| 0935 | -Walk around/take pictures at Fire Truck Maintenance Building (Building 18) |


-Whidbey 36 and 37 parked behind fire truck maintenance facility (Facing North).


-Whidbey 36 and 37 parked side-by-side south of fire truck maintenance facility (Facing East).


-Fire Trucks Whidbey 36 and 37 (Facing West).

-Water (left) and AFFF (right) tank openings on Whidbey 36 from top of Whidbey 37 (Facing North).



-Whidbey 37 water (left) and AFFF (right) tanks (2’x2’ openings). Labeled Foam tank and Water tank.

| | |
|---|---|
| |  <br>-Grassy area west of fire truck maintenance facility (Facing Southwest). |
| 0945 | -Ran into Tom Prince while they were refilling the hazmat truck tires with air. Asked a few questions about maintenance facility and fire station (Building 16). |
| |  <br><br>-Large storm drain north of fire truck maintenance (Facing South). Fire trucks were often worked on in these garages. Truck seen on left was hazmat truck and was having tires refilled. |

| | |
|---|---|
| |  <br>-Close up view of storm drain north of fire truck maintenance building, water present a few feet below the grate. |
| 0950 | -Walk around/take pictures at Seaplane Base Fire Station (Building 16). |
| |  <br>-Front entrance to Seaplane Base Fire Station. Fire Station Locked and nobody in it according to Tom Prince (no AFFF stored here currently) (Facing West). |

-Fire truck garages at fire station (no trucks currently inside) (Facing Southwest).

-Fire station from the back and grassy area in between fire station and fire truck maintenance building (Facing Southeast).

| | |
|---|---|
| 1000 | -Drive to Fuel Farm 1 Area southeast of fire station and south of weapons storage facilities, where sludge potentially containing PFAS may have been placed, to confirm well network is present and take pictures of area. |
| |  <br>-Confirmed that extensive monitoring well network exists. Area is slightly higher elevation than structures to the north and west (Facing Southwest). |
| |  <br>-More monitoring wells, walked around in brush but found no recent evidence of material being placed here (Facing North). |

| | |
|---|---|
| |  <br>-More wells, fenced area to the west of current location (Fuel Farm Area 1) (Facing Northeast) |
| |  <br>-Wells on other side of fence in Fuel Farm Area 1 (Facing Southeast). |
| 1020 | -Drive to Seaplane Base Sewage Lagoons to take pictures and walk around |

-Lined sewage lagoons (From southeast corner facing North).

-Wastewater Treatment Plant Building (Building 2615) (Facing southwest).

-Marsh land east of sewage lagoons (Facing East).

-Treatment ponds (facing Southwest)